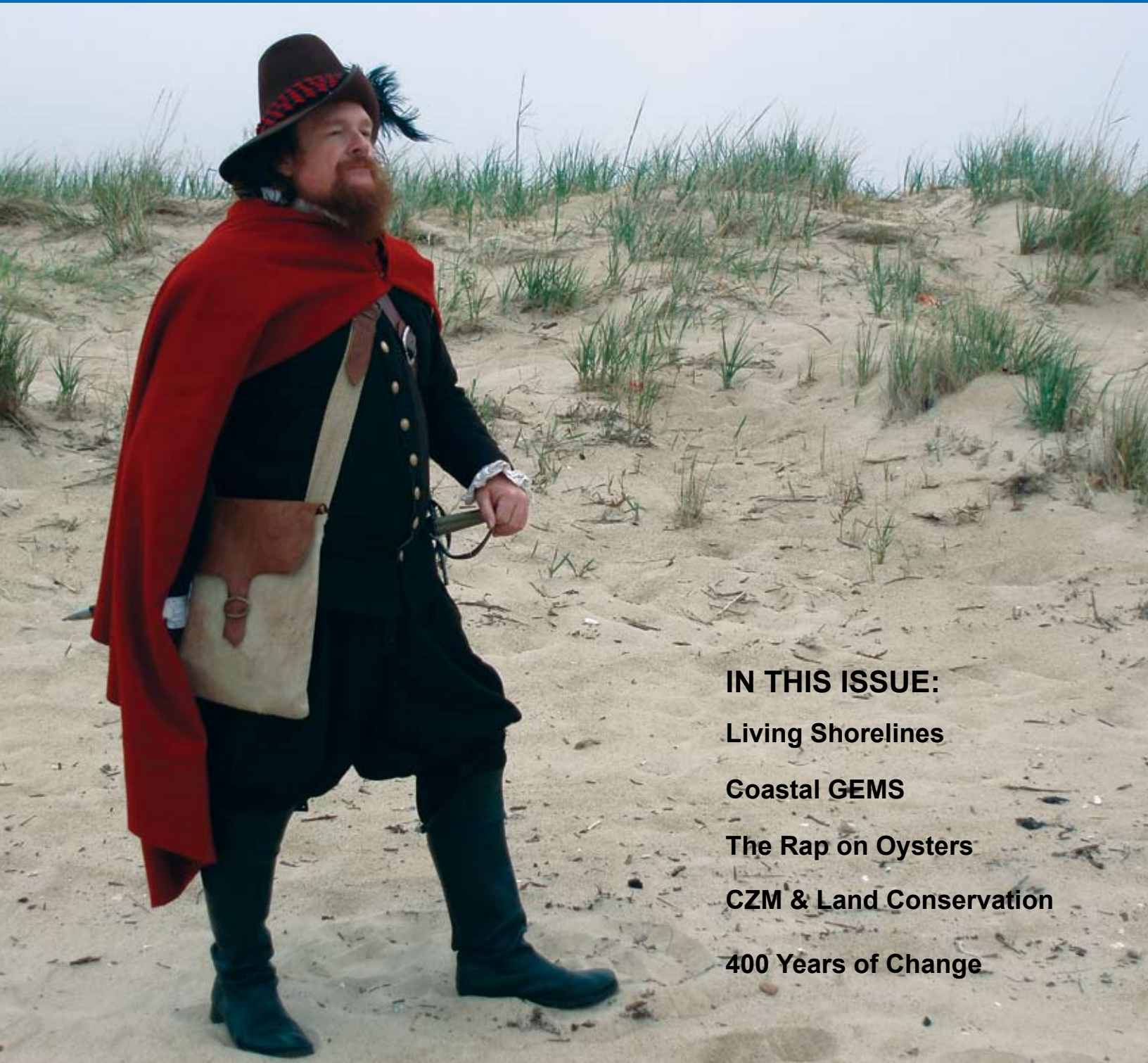




# Virginia Coastal Zone Management

Spring/Summer 2007



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**400 Years of Change**



**Virginia Coastal Zone**  
MANAGEMENT PROGRAM

Protecting, restoring, strengthening our coastal  
ecosystems & economy

# Virginia Coastal Zone Management Program

The Virginia CZM Program is a network of state and local government agencies working to create more vital and sustainable coastal communities and ecosystems. Virginia's coastal zone includes the 29 counties and 17 cities of Tidewater Virginia and all tidal waters out to the three mile territorial sea boundary.

The Virginia CZM Program includes state and local laws and policies to protect and manage Virginia's coastal resources, implemented by:

Virginia Department of Environmental Quality— lead agency  
Virginia Department of Conservation and Recreation  
Virginia Department of Game and Inland Fisheries  
Virginia Department of Health  
Virginia Marine Resources Commission  
Tidewater Local Governments

The Program is guided by the Coastal Policy Team which provides a forum for managing cross-cutting coastal resource issues. The Coastal Policy Team is comprised of the partner agencies listed above as well as:

Virginia Department of Agriculture and Consumer Affairs  
Virginia Department of Forestry  
Virginia Department of Historic Resources  
Virginia Department of Transportation  
Virginia Economic Development Partnership  
Virginia Institute of Marine Science  
Virginia Planning District Commissions (8 Tidewater regions)

The Virginia CZM Program is part of the national coastal zone management program, a voluntary partnership between the National Oceanic and Atmospheric Administration and U.S. coastal states and territories authorized by the Coastal Zone Management Act of 1972, as amended.

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Visit us on the Web at: [www.deq.virginia.gov/coastal/](http://www.deq.virginia.gov/coastal/)

Cover Photo: *What a site greeted the eyes of Captain John Smith (brought to life by historical interpreter, Dennis Farmer, Living History Associates) and the other members of the Virginia Company - the dunes and beaches of Virginia's coast. Even after 400 years of change, perhaps these men would recognize this part of First Landing State Park. Photo by Patsy Arnett, Arnett and Associates.*



# Message from the Program Manager

Little did we know how popular our oyster mascot, Omar of the Reef, would become! Believe it or not, he has a Japanese fan club headed up by our friend, Urara Takashima, pictured here wearing his costume. Omar was actually given an all-expenses-paid trip to Tokyo by the organizers of the US-Japan Oyster Reef Symposium. Page 21 has the details. We CZM staff were quite envious.

But we've been busy here in Virginia gearing up for our Living Shorelines initiative (page 2), launching our new internet mapping system, Coastal GEMS (page 6) and trying to help Governor Kaine meet the goal of conserving 400,000 acres by 2010 (page 12). It's a lot for the six of us, but we have loyal partners who make the work rewarding.

Pressure on our coastal ecosystems continues to intensify, but our ability to implement these programs may not be sustained. The federal funds provided for our CZM program have decreased from a high of \$3.2 million in 2003 to \$2.5 million for 2007. We hope you'll agree this work is important and you will let others know how you feel. After all, don't Virginia's coastal gems deserve better?



*Laura McKay, Manager, Virginia CZM Program, and Japanese researcher Urara Takashima enjoying the Program's Omar costume.*

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*Front row (left to right) Jacquie Shapo, Kelly Price, Shep Moon. Back row (left to right) Laura McKay, Rachel Bullene, Virginia Witmer.*

Julia Wellman, DEQ



Virginia Coastal Zone  
MANAGEMENT PROGRAM

# LIVING SHORELINES

By Shep Moon, Virginia CZM

Virginia has approximately 5,000 miles of shoreline lined with marshes, beaches and tidal mudflats that provide a rich habitat for a wide variety of plants and animals. There is growing concern, however, that increasing “hardening” of the shoreline by installing rock revetments and wood or vinyl bulkheads is damaging these critical, natural, shoreline habitats. From 1993–2004, for example, approximately 230 miles of new, “hard” erosion protection measures were installed in Virginia.

Equal and sometimes better shoreline protection can be achieved with the relatively new technique of “living shorelines.” An alternative to hardening, living shorelines employ natural habitat elements to protect shorelines from erosion while also providing critical habitat for wildlife and water quality benefits. These techniques are also proving to be more resilient to severe storm events than conventional structures.

## Virginia CZM's Shoreline Strategy

To help promote the use of living shorelines and to improve shoreline management in general, the Virginia CZM Program included a Shoreline Management Strategy as one of its CZMA Section 309 initiatives for 2006 through 2010. Virginia CZM has allocated \$750,000 over five years for the following anticipated outcomes:

- A “Living Shoreline Summit,” with peer reviewed proceedings, to advance the use of this management technique.
- Revised “Wetlands Guidelines” to be used by the Virginia Marine Resources Commission, the Virginia Institute of Marine Science, local wetlands boards and others to guide decisions about shoreline and tidal wetlands management.
- Improved data on shoreline conditions to support more informed shoreline management decisions.
- Research to document the habitat value of living shorelines and to improve their design.
- A guidance document for local governments to use in shoreline management planning.
- Outreach materials for land use decision-makers, landowners and contractors on living shoreline advantages and design principles.
- A training program for contractors and local government staff on living shoreline practices.

- A [report](#) on improving management of Virginia's dune and beach resources, including proposed revisions to the Coastal Primary Sand Dunes and Beaches Act.
- Anticipated [changes](#) to the Coastal Primary Sand Dunes and Beaches Act by the Virginia General Assembly.
- Revisions to the Coastal Primary Sand Dunes / Beaches [Guidelines](#).

Funding for the first of these outcomes became available in October 2006 and several of the projects are well underway. The Living Shoreline Initiative had its formal kickoff with the Living Shoreline Summit, held in Williamsburg on December 6 and 7, 2006. The Summit was a collaborative effort between the Virginia and Maryland Coastal Zone Management Programs and National Estuarine Research Reserve Systems, as well as, a number of other public and private organizations.



Attendees of the first Virginia/Maryland Living Shoreline Summit take advantage of the opportunity to network.

## Summit Results

The Summit was very well received and attended with over 180 participants including shoreline management contractors, landowners, environmental groups, coastal resource managers, scientists and others. This diverse group came together to learn and share information about living shorelines. Discussion focused on facilitating and promoting the use of “Living Shoreline” techniques, with sessions on the current status of research, site suitability and design methods, decision-making tools, state-specific management and policy, and education and outreach.

The Summit showed that there is great potential for living shorelines. But more work is needed to ensure waterfront property owners are aware of this technique as early as possible in the

*Living Shorelines are restored shorelines that, in addition to protecting property from erosion, provide habitat for fish, birds and other wildlife. Like undisturbed natural shorelines, they also protect water quality by trapping excess nutrients and sediment.*



Karen Duhring, VIMS

decision process. In addition, regulatory and financial incentives would help to further promote living shorelines. A panel discussion at the Summit focused on ways to improve the current regulatory process in order to promote the use of living shorelines where appropriate. Panel members and the audience agreed that the current system, while it does not discourage the use of living shorelines, also does not actively encourage or provide incentives for living shorelines. Participants felt that structural approaches to shoreline management were the accepted norm and that landowners were comfortable with this approach, in part because structural solutions were more familiar to them, to their neighbors, and to those involved in the permitting process. Participants also agreed that new requirements for mitigation of any tidal wetland impact are likely to increase landowner interest in living shorelines as a way to avoid mitigation requirements.

Lastly, there was agreement on the importance of influencing waterfront property owners' decisions about shoreline management techniques prior to their submitting a permit application. The group felt that at the point of application submittal, landowners had committed substantial resources toward selecting a specific design and that it was difficult to alter the design after that point.

Suggestions offered by both panel members and attendees of the Living Shoreline Summit are outlined to the right and on the following page. Some of the suggestions are already being addressed through the Virginia CZM Program Shoreline Strategy.

### *Assist Waterfront Property Owners:*

- Develop outreach materials and an outreach program for property owners. Hold workshops, develop on-line decision-making tools, and construct local demonstration sites to help property owners with their initial decisions about shoreline management.
- Provide design assistance to homeowners. One option would be to expand the reach and scope of the Shoreline Erosion Advisory Service (SEAS) at the Department of Conservation and Recreation.
- Provide opportunities for property owners to consult with representatives from advisory and regulatory agencies prior to submitting permit applications.
- Develop a living shoreline certification process for shoreline contractors so property owners can be assured that the contractor is proficient in this technique.
- Provide financial incentives to property owners, such as grants, low interest loans for construction, tax breaks and reduced permit fees. Financial disincentives could also be used in cases where a living shoreline approach was deemed feasible, but not chosen.



David Burke

*Living Shorelines involve marsh restoration and may include the use of a rock sill to reduce wave energy.*

### **Provide Regulatory Guidance on Living Shorelines:**


- Modify the model ordinance used by localities to manage shoreline development through the Tidal Wetlands Act.
- Modify the Tidal Wetlands Guidelines to reflect a preference for living shorelines where appropriate.
- Revise the Joint Permit Application (JPA) to state the preference for living shoreline approaches where appropriate. Provide a sequence of priorities in the JPA and ask project proponents to justify their project. If structural approaches are desired, ask the property owner to demonstrate why a living shoreline approach wouldn't work on their shoreline.
- Review shoreline erosion control projects holistically by evaluating the continuum of coastal resources that may be affected. This would include not only resources along the shoreline, such as wetlands, beaches and dunes, but also in the riparian (upland) and littoral (shallow water) zones. It was noted that in some cases structures had been moved landward from their original position in order to avoid the jurisdiction of the Tidal Wetlands Act.
- Improve the shoreline management provisions of the Chesapeake Bay Preservation Act's regulations and improve the Water Quality Impact Assessment (WQIA) for shoreline projects.
- Provide additional training for local wetland board members that includes guidance on how the protection of various coastal resources should be prioritized.

### **Simplify the Regulatory Process:**

- Develop a general permit for living shorelines while retaining the oversight authority necessary to protect

coastal resources. This should result in reduced review time and lower permitting fees because public hearing advertising fees would be eliminated. It would also require legislative authority from the Virginia General Assembly and living shorelines would have to be defined specifically in the Virginia Code.

- As an alternative to a general permit, provide some other form of expedited permit review for living shoreline projects. Streamline the review process for nonstructural shoreline projects, including administrative approval and a process for exceptions.

The Living Shoreline Summit Proceedings will be available on the web in late summer or early fall. A link to the downloadable report will be available on the Virginia CZM website at [www.deq.virginia.gov/coastal/livingshorelines.html](http://www.deq.virginia.gov/coastal/livingshorelines.html). 

## **National Academy of Science Study - Mitigating Shore Erosion on Sheltered Coasts**

*According to this study by the National Research Council, issued in October 2006, erosion will destroy many of the nation's estuaries, bays, lagoons and mudflats unless there are major land-use regulations along sheltered coasts in the United States.*

*The National Academy of Sciences report concluded that local regulatory regimes must be replaced with approaches for larger regions that are carried out with an eye to long-term effects. Property owners and regulators must think beyond rock and concrete and consider new protection methods for coastal areas, such as marshes and other living features.*

*The report is on the National Academy of Sciences website at <http://nationalacademies.org/morenews/20061012.html>.*

*An abstract of the report is available at [http://dels.nas.edu/dels/rpt\\_briefs/shore\\_erosion\\_final.pdf](http://dels.nas.edu/dels/rpt_briefs/shore_erosion_final.pdf).*

# CHESAPEAKE CLUB EXPANDS!

By Virginia Witmer, Virginia CZM

Did you catch one of those unusual and humorous ads that hit the airways and papers this spring imploring you to wait until fall to fertilize your lawn and join the many who already "Save the Crabs... Then Eat 'Em?"

Between March 5 and April 9, television ads appeared on 23 cable and network affiliated channels in the Richmond and Hampton Roads regions - over 645 "spots" in all. In addition, over a dozen newspaper ads appeared in the Richmond Times-Dispatch, Daily Press and Virginian Pilot. Begun in the DC area two years ago, the Chesapeake Club has expanded. But don't worry! If you missed the invitation to join this spring, it's not too late to learn how and do it today!

The ads are humorous, but the issue is very serious. Lawn care is a contributor to nitrogen loading in the Chesapeake Bay. Excess nutrients cause algal blooms, which block sunlight from reaching Bay grasses. Bay scientists have found that 30 times more juvenile crabs live in Bay grass than in areas without. If we do not reduce the nutrients flowing into our streams, rivers and the Bay, the Blue Crab, and many other species that live in our coastal waters, will continue to dwindle. Our plates will be quite empty. "Just as it did in the DC area, Chesapeake Club capitalizes on our region's love for fresh, abundant seafood," explains Julia Hillegass, a senior planner and environmental educator with the Hampton Roads Planning District Commission (HRPDC). "The television spots are wildly popular with all ages."

The ads appeal to our sense of humor, but they also urge us to make a commitment. The behavior we are asked to change, however, is really quite simple - don't fertilize your lawn in the spring. Wait until fall to fertilize when fertilizer runoff is less likely and less damaging to the Bay. And, it doesn't mean your lawn pays a price - it is actually better for your lawn if you wait 'til fall to fertilize. The grass roots are better able to absorb nutrients contained in fertilizer in the fall. Virginia's cool season grasses store more food and build healthier roots when fertilized in the cooler months of fall rather than spring. The result - more nutrients are available to the grass when it greens up in spring.



Chesapeake Club

*Crab Kwon Do, a humorous computer animated video, is designed to share via e-mail, pique the interest of viewers and connect them to the Chesapeake Club website.*

As it did during its first successful run in the DC area, the Chesapeake Club campaign is proving once again how important it is for a successful social marketing campaign to establish partnerships, particularly new and unique partnerships, that help it expand its resources and reach a larger audience with a consistent message. With funding from Virginia CZM and the Department of Conservation and Recreation, HRPDC (and its 17 localities), the City of Richmond, the counties of Chesterfield, Henrico and Hanover, and the Chesterfield Cooperative Extension Office are recruiting lawn care companies and restaurants to help distribute the Chesapeake Club's message to homeowners. "The Chesapeake Club campaign illustrates how nontraditional partnerships can help us spread and reinforce an environmental message in an unexpected and clever way," explains Hillegass. "Restaurants in the Hampton Roads area have really jumped on the opportunity to participate in the campaign. They love the message and materials (coasters) and are eager to continue supporting the campaign into the future."

So, after the ads have run, and the seeds of change have been planted, it's these on-the-ground grassroots partnerships that will help keep the momentum going. Commitment sows commitment. In Chesterfield County that commitment can be seen in the county's extension office staff, who personally connect with up to 700 homeowners a year. They are carrying the Chesapeake Club message out into the community and demonstrating how step by step, the individual homeowner can become a member of the club. "As we call landscapers about participating in the Chesapeake Club," reports Heather Barrar, an environmental outreach coordinator with Chesterfield County, "we are finding that homeowners have already asked for bay friendly services. As it turns out, the homeowners recently received a visit from their county extension agent."

*For a current list of restaurants and lawn care companies participating in the club, go to*  
[\*www.chesapeakeclub.org!\*](http://www.chesapeakeclub.org)

# COASTAL GEMS

By Kelly Price, Virginia CZM

## *...A Gateway to Information on the Location, Value and Management of Virginia's Coastal Resources*

The Commonwealth has long awaited an Internet mapping system, free for anyone to use, that shows a comprehensive inventory of Virginia's natural resources. Virginia CZM has been involved in this effort since 1988! First there was the "Virginia Rivers Inventory" in the late 1980's, then "EcoMaps" in the 1990's, but budget and politics impeded progress. In 2001, at a Coastal Partners Workshop, we came back to this idea when our state and local partners expressed the need for a "vision" of the coastal zone. They wanted to see where all of the best remaining coastal resources actually are. Seeing the resources in one big picture could simplify the task of connecting local land use planning decisions to state and federal water use policies. A stronger understanding of how activities on the land and in the water affect one another would enable everyone to better protect and manage coastal resources in a logical and sustainable fashion - something critically needed in light of today's increasing development pressures.

Although spatially displayed data for aquatic and terrestrial ecosystems are becoming more and more accessible through the Internet, often these data are sequestered in different agencies' and organizations' websites and are not joined into one central application to allow all users equal and efficient access. The vision was to build this type of access.

### Addressing the Need

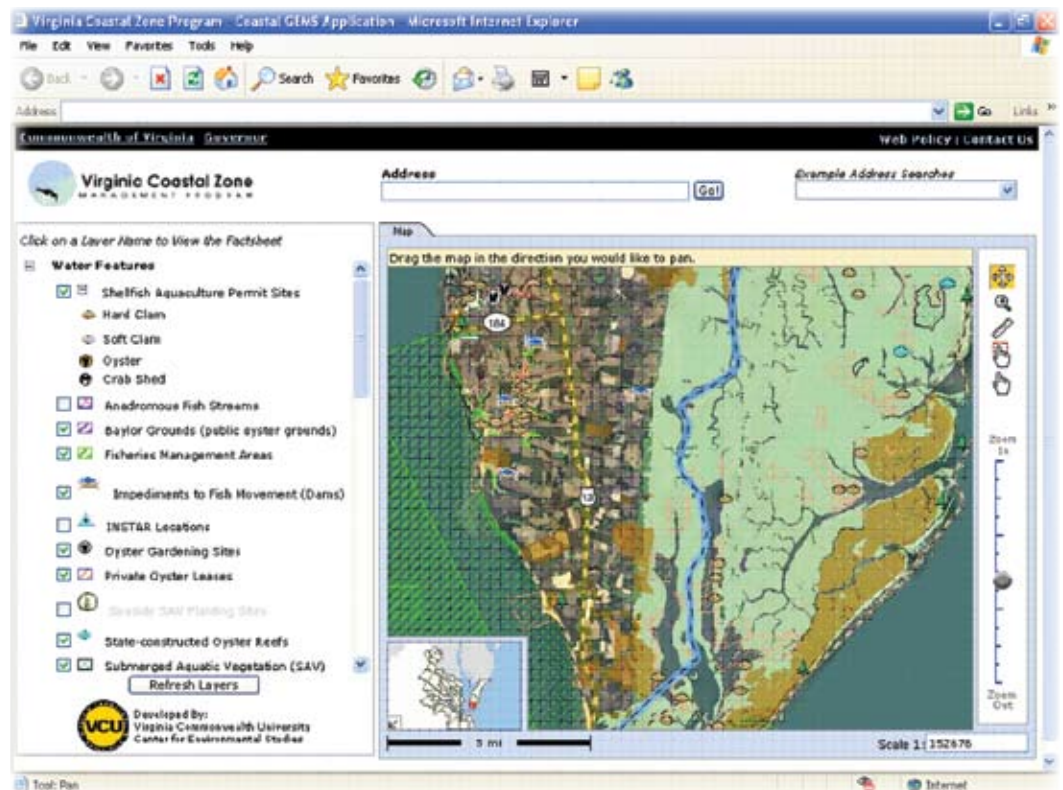
Our coastal partners first asked us to identify the best remaining green (land-based) and blue (water-based) resources and to develop a tool that enables them to be mapped together. Over the last five years, Virginia CZM has been doing just that. We've funded several data development projects that are now the "crown jewels" of Coastal GEMS. The data layers representing "blue infrastructure" are primarily the result of three

CZM projects costing about \$530,000. The marine data, produced by the Virginia Institute of Marine Science (VIMS), defined geographic areas for important marine resources (e.g. oyster reefs, underwater grasses) and converted the Marine Resources Commission's (MRC) fisheries management areas from an AutoCADD database to GIS. The freshwater data, produced by Virginia Commonwealth University (VCU), is called the Interactive Stream Assessment Resource (INSTAR) and assesses stream health based on fish, macro-invertebrates, habitat and stream geomorphology.

We are also mapping "green infrastructure." The primary layers are the Hampton Roads Conservation Corridor Study completed in May 2006 (for about \$40,000 in CZM funds) by the Hampton Roads Planning District Commission, and the Virginia Conservation Lands Needs Assessment (VCLNA) being completed this year by the Department of Conservation and Recreation's Division of Natural Heritage (for about \$204,000 in CZM funds). are the major contributing layers.

### A Vision is Made a Reality

These blue and green data layers drove the idea of a "Blue-Green Infrastructure Portal" - a website gateway, or starting point, for accessing comprehensive coastal resource data, maps,



and information from all natural resource agencies and coastal partners. The Blue-Green Infrastructure Portal was not a name that rolls off the tongue, so now we call it "Coastal GEMS" - the Coastal Geospatial and Educational Mapping System. In 2003, we contracted with the VCU's Center for Environmental Studies to create the Coastal GEMS portal. Holistically, the data incorporated into Coastal GEMS is a result of collaborative discussions and data-sharing efforts between many partners with a vested interest in the coastal zone.

Coastal GEMS is now a dynamic Internet mapping application with aerial imagery, reference data layers such as roads and streams, and over 40 data layers of land and water coastal resources, models and examples for conservation planning (see sidebar on page 8). The mapping tools allow you to easily investigate and navigate through the coastal zone. Unique selection tools allow you to generate tables of coastal resource information for a selected area that can be exported or printed for further use and analysis.

As we compiled the broad array of coastal resource data, we realized that breadth reflected the complexity of Virginia's state and local management of coastal resources. The divisions of management authorities are really too esoteric to expect the general public to understand. So, in addition to the mapping component of Coastal GEMS, we created a "fact sheet" for each data layer that breaks down the complexity of coastal resource management. The fact sheets provide brief information and links to in-depth information on:

- The value of the resource (ecological, economic, and social).
- Management of the resource (at local, state, and federal levels).
- Why and how the data was developed.
- How to directly download the data or who to contact to obtain the dataset.
- Future directions if the data is associated with a long-term funded project.
- Frequently asked questions received from the general public.

## Everyone Can Use Coastal GEMS!

You don't need to be computer savvy nor a coastal resource expert to use Coastal GEMS. The easy-to-use mapping features and fact sheets make Coastal GEMS a resource for everyone.

There are many potential uses for Coastal GEMS at all levels. [Local and regional planning agencies](#) can use the data to better

## DEQ Director Helps Launch Coastal GEMS



Julia Wellman, DEQ

*Director David Paylor discusses DEQ's responsibility as lead agency for the Virginia CZM Program with Rex Springston of the Richmond Times-Dispatch.*

*After years in the making, on February 12, 2007, Virginia CZM gratefully launched and demonstrated the availability of Coastal GEMS. A week-long display in the lobby of the General Assembly Building allowed legislators and visitors to try out the Internet mapping application.*

*The highlight of the week was our celebratory launch on February 14. Nikki Rovner, Deputy Secretary of Natural Resources; David Paylor, Director of the Department of Environmental Quality; Dan Widner, Coordinator of the Virginia Geographic Information Network; and Greg Garman and Will Shuart of VCU's Center for Environmental Studies addressed the gathering and noted the enormous potential for Coastal GEMS to improve decision-making, to promote proactive planning, to help reach the Governor's 400,000-acre goal and to increase community involvement in coastal zone management. "For the community to be involved in coastal issues, they need to have easy access to information," said David Paylor. "Coastal GEMS brings together information from all of the CZM partner agencies and localities in one place and makes it available to everyone."*

*On the DEQ homepage, Director Paylor has highlighted four of the many issues which the agency will be focusing on this year:*

- *Beginning the first-ever detailed assessment on the effects of mercury in air emissions*
- *Identifying ways to improve recycling and setting realistic goals for rural communities*
- *Continuing to investigate fish kills in the Shenandoah*
- *Supplementing Coastal GEMS' already extensive database with additional information.*

manage a growing community by determining the most suitable areas for both conservation and development. Localities can also use Coastal GEMS to unravel the complexities of existing use conflicts along the waterfront (see [page 14 for more on waterfront use conflicts](#)). Planning tools such as comprehensive plans, zoning and land use ordinances, purchase and/or transfer of development rights programs, establishment of resource management areas,

can be better informed by using Coastal GEMS. A tool that has proven to be instrumental in protecting coastal resources in one locality may be just as effective in another. For this reason, good conservation planning decisions and tools are shown as examples on Coastal GEMS to promote easy sharing of ideas.


**State and federal agencies** can use the data to better manage projects such as roads, major facilities, habitat restoration plans, wildlife management plans, and public access plans. They can also use it as a starting point for environmental review and permitting processes in order to easily access other agencies' data for quick assessments.

**Academic institutions** can use the data to educate students about coastal resource uses and values, and to provide a base of information for classroom projects and research. Since much of our coastal resource assessment, research, and data collection is conducted by academic institutions, Coastal GEMS can help identify data "gaps," or areas where further research is needed to improve the quality of data upon which management decisions are based.

**Non-governmental organizations, citizens' advocacy groups, and landowners** can use the data to learn more about the status of Virginia's coastal resources and formulate their position on the potential impacts of local, state, and federal projects on these resources. Coastal GEMS can increase community involvement and understanding in coastal resource or land management decision-making processes. In addition, **land trusts and conservation organizations** can use Coastal GEMS to select optimal sites for habitat restoration or land acquisition, whether the acquisitions are for ecological, recreational, or historic/cultural purposes (see page 10 for more on how the CZM Program is helping to meet the Governor's land conservation goals).

## Future Directions and Development

Over the next 4 years, Virginia CZM has \$288,000 available from NOAA to develop new datasets and tools that fill data gaps, improve and update existing datasets, hold "Coastal GEMS Open Houses" in Northern Virginia, Richmond, and Hampton Roads, and hold training sessions with partners.

Word has been spreading about Coastal GEMS – even as far as California! Feedback will be instrumental in developing the next version, which will include the addition of many more data layers (see sidebar at left) and we'll continue to work with VCU and their subcontractor, WorldView Solutions, to improve Coastal GEMS. For more information or to provide feedback, please contact Kelly Price at Kelly.Price@deq.virginia.gov or (804) 698-4260. 

## Current GEMS Partners and Data Layers

**\*\* Coming soon!**

### Water Features

- Fisheries Management Areas
- Baylor Grounds (Public Oyster Grounds)
- Private Oyster Leases
- State Constructed Oyster Reefs
- Commercial Shellfish Aquaculture Sites
- Oyster Gardening Sites
- Submerged Aquatic Vegetation (SAV)
- Seaside SAV Planting Sites
- Anadromous Fish Use Areas
- Threatened & Endangered Species Waters

### Shoreline Features

- Beaches Above High Water
- Chesapeake Bay Dunes
- Wetlands (Tidal & Non-Tidal)
- Restored Riparian Buffer Sites \*\*
- Historic Shorelines \*\*

### Land Features

- Conservation Lands \*\*
- Virginia Natural Landscape Assessment (VANLA)
- Forest Cover
- Maritime Forest \*\*
- Barrier Island Ownership

### Wildlife Features

- Essential Wildlife Habitat
- Important Bird Areas
- Migratory Songbird Stopover Habitat

### Recreational Features

- Boat Ramps (DGIF maintained)
- Scenic Rivers
- Birding & Wildlife Trail Sites and Loops
- Seaside Eastern Shore Water Trail
- Chesapeake Bay Public Access Sites \*\*

### Conservation Planning Tools

- Clam Aquaculture Suitability Model
- Oyster Aquaculture Suitability Model \*\*
- Seaside Invasive Reed (*Phragmites*)
- Historic & Cultural Value Model \*\*
- Predicted Growth Model \*\*
- Marina Siting Suitability Model
- Impediments to Fish Movement
- Impaired Waters \*\*
- Biotic Stream Assessment (INSTAR) Locations
- Recreational Value Model \*\*
- Hydrologic Integrity Model \*\*
- Agricultural Value Model \*\*
- Forest Economics Model \*\*
- Embayment Flushing Rates \*\*
- Potential Wetland Restoration Sites \*\*
- Benthic Index of Biotic Integrity \*\*
- \* Shellfish Condemnation Zones \*\*

### Conservation Planning Examples

- Special Area Management Program Boundaries
- Hampton Roads Conservation Corridors \*\*

### Reference Layers/Map Background

- County Boundaries
- Detailed Streams
- Roads
- Watershed Boundaries \*\*
- Aerial Photography (2002 & 2006 VBMP)



# Explore the Middle Peninsula's Coastal Experiences, On-Line and In-Person

By Jacqueline Shapo, NOAA/CSC  
Coastal Management Fellow

Trip planning has evolved into a virtual experience. Yet, on-line access to many of Virginia's rural coastal communities has not been easy to navigate. As a result, these communities are not benefiting from the increased revenue being generated by the on-line tourism market.

The Middle Peninsula has put out its Internet welcome mat with a new project funded by Virginia CZM. The Middle Peninsula Planning District Commission (MPPDC) partnered with the Middle Peninsula Tourism Council and Vanguard Web Studios to design a pilot website – a dynamic, easy-to-navigate guide to “coastal experiences” in the Middle Peninsula. Thanks to an enthusiastic response from the region's communities, the website is growing.

The “Coastal Experience” website highlights destinations that offer some access or connection to the water, including all publicly owned boat ramps, parks, natural areas, fishing piers, and beaches. The website encourages visitors to paddle a water trail, fish from a pier, and explore a nature trail or natural area boardwalk. The website also encourages visitors to patronize one of the many businesses that support the Middle Peninsula's coastal economy or are unique to its cultural or maritime heritage.

The Middle Peninsula Tourism Council is hosting the website. The Council represents six counties and three towns on the Middle

Peninsula and is staffed by tourism marketing representatives that know the Peninsula well. The Council also serves as the Middle Peninsula's Destination Marketing Organization (DMO). DMO's promote Virginia tourism at the state, regional and local level and focus on compatible, sustainable economic growth. Since the Council, by virtue of its representation, reports back to the MPPDC and the PDCs member localities, it is the ideal organization to host the pilot website and maintain its content.

For all involved, the hope is that this dynamic pilot website will expand to include all Virginia coastal localities and promote environmentally-sensitive and sustainable tourism across the coastal zone.



## Visit the Middle Peninsula!

### Step 1: Go On-line!

[www.visitrivercountry.org](http://www.visitrivercountry.org)

*Access an interactive map of the region*

*Use the search tool to locate coastal experience sites*

*Print out or e-mail a detailed trip itinerary*

### Step 2: Get Out There!

# THE RAP\* ON OYSTERS

By Laura McKay, Virginia CZM

A painful, awkward silence fell over the small group of managers, scientists, watermen, businessmen and environmentalists gathered at the Chesapeake Bay National Estuarine Research Reserve at VIMS on January 25, 2007. As the meeting facilitator, I truly did not know what to say.

## An Icy Silence

We, the vestiges of our Virginia Oyster Heritage Program who began with such hope and gusto in 1999, had been asked by the Marine Resources Commission to reconvene to develop a plan for managing the beleaguered oysters in the Rappahannock River that we had tried to restore. After an hour of scientist/manager discussion about where we had built sanctuary reefs, whether biomass was actually increasing on adjacent but closed harvest areas, where circulation patterns may be carrying baby oysters before they attach to hard shell, how many oysters die from the diseases MSX and Dermo and how just plain hard it has been to accomplish any increase in oyster populations, the watermen finally spoke up. Their frustration and anger was unleashed. “Why”, they asked, “don’t you just stop spending taxpayers’ money and leave us alone? Let us manage the Rappahannock by ourselves.” So yes, that’s when the awkward silence chilled us just as uncomfortably as the snow beginning to fall outside.



Virginia Witmer

I believe some in the room would have liked nothing better than to get up and leave at that point – the chill outside preferable to that inside. Leaving behind their years of struggles with the seemingly doomed Virginia oyster might be a relief and free up time to work on more tractable issues.

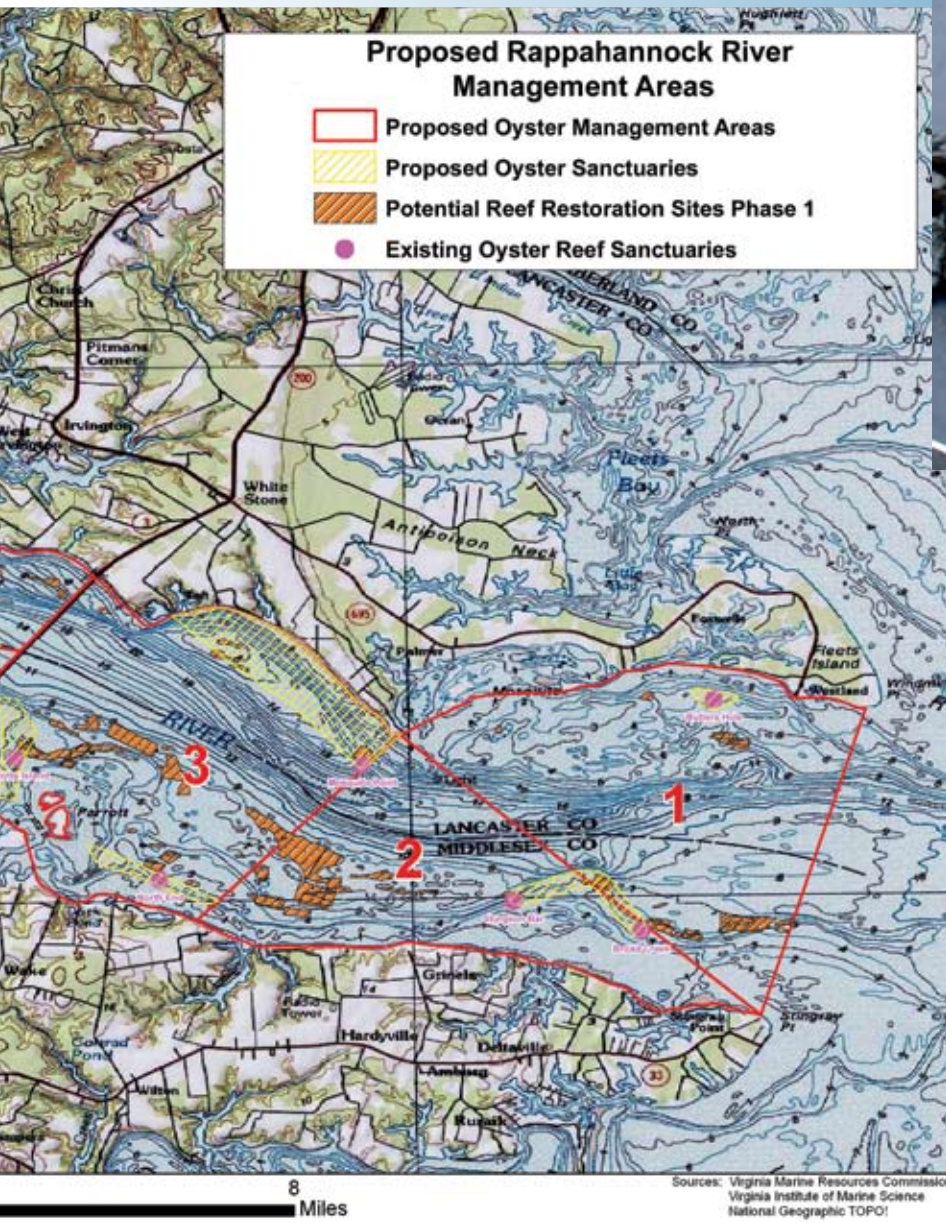
But to everyone’s credit, they all stayed. The silence was finally broken by two questions. “Do we have an upper size limit on oysters?” asked a retired businessman. “What about a rotational harvest system like they have for sea scallops on Georges Bank off the New England coast?” asked a scientist. It seemed as if the snow outside had entered the room and transformed to magic fairy dust. Suddenly everyone was leaning forward in their chairs and talking!



Dr. Jim Wesson, VMRC, monitoring oyster growth.

Perhaps the key change was the recognition among all of us that “ecological restoration” of the native oyster is a very lofty goal right now given the severe disease and predation constraints on oysters. Perhaps we need to first see whether we can even maintain a small oyster fishery. Even if oysters are harvested, they have provided their water filtering and spawning benefits to the public for at least 2 years. But we have kept the entire lower Rappahannock closed to harvesting for many years hoping to see an increase in total oyster biomass. But how long would everyone wait? Patience had already worn more than thin among the watermen. They’ve wanted the lower Rappahannock re-opened for at least 5 years.

\* to discuss freely or at length (American Heritage Dictionary)



Map of proposed management plan for the Rappahannock River.

Although there are some large oysters (3-4 year olds that may be disease-resistant "genetic gold" that should not be harvested but left alone to reproduce), most of the oysters die from disease and predation. And so each year, in front of the Virginia Marine Resources Commission, there has been a huge battle between the watermen and the scientists/managers about when the lower Rappahannock could be re-opened for harvest.

## A New Plan for the Rappahanock

This new idea of a rotational harvest plan gave some hope to the watermen. If we divide the Rappahannock into areas that each contain broodstock sanctuary reefs and rotate harvests



Virginia Witmer

A handful of native oysters.

among these areas such that each area would be left alone for two years and then harvested in a third year, and we impose an upper size limit so that any oysters harvested that might be 4 years old or larger must be returned to the water, could we attain some measure of conservation and also some vestige of a commercial fishery? And what might all of that cost?

The basic concept was presented to the Virginia Blue Ribbon Panel on Oysters on March 19 by Dr. Jim Wesson of the Virginia Marine Resources Commission. The panel was very pleased with the concept and anxious to have it replicated throughout the coastal zone. But there are more details to work out over the summer such as the exact dividing lines between the areas (which will depend on water circulation modeling data from VIMS) and exactly how to protect the larger oysters and what, if any

gear restrictions or changes in licensing and entry into the fishery should also be considered. Also, we need to exercise caution about costs and benefits, and who pays.

To begin to get a handle on these economics, the Virginia CZM Program is funding a small grant this summer to document the costs associated with this plan. The Marine Resources Commission will consider adoption of this new Rappahannock plan at their September 25, 2007 meeting before the next oyster harvesting season begins. Later in the year, Virginia CZM hopes to fund a follow-up study of the estimated benefits of the plan. Our hope is that all of our marine science and economic data will guide us toward the best possible decision for everyone involved in this public resource. 🐟

# CZM & LAND CONSERVATION

By Laura McKay, Virginia CZM

As all of Virginia's land conservation agencies and organizations strive to meet Governor Kaine's ambitious goal of protecting 400,000 acres by 2010, you might ask, "[How can our Coastal Zone Management program help with land conservation?](#)" "[Let me count the ways,](#)" as Elizabeth Barrett Browning would say...

## 1 CZMA Grants

The first way is through Section 306A of the federal Coastal Zone Management Act which allows CZM programs to use up to 10% of their federal funds for acquisition of fee simple or other interests in land. We set aside \$200,000 each year for land acquisition. Since 1991 the Virginia CZM Program has spent \$2,653,683 to acquire 1,078 acres of coastal lands. That's nice, but admittedly, rather slow going if we are ever going to meet Governor Kaine's ambitious goal!

Our most recent land purchase, in September 2006, in partnership with the Department of Conservation & Recreation and the Virginia Land Conservation Foundation, was the Magothy Bay Natural Area Preserve on the Eastern Shore (see green area on map at right). CZM funds accounted for \$854,791 (almost 25%) of the cost for this 285 acre parcel which The Nature Conservancy purchased and held until government grants could be secured. We also had a little help from our friends singer/songwriter James Taylor and his wife Caroline who donated matching funds for our CZM grants.

The US Fish & Wildlife Service is buying the southern 207 acres of this tract (*shown in purple on map at right*), creating a fabulous, contiguous 492-acre area which adjoins the Department of Game & Inland Fisheries' 356-acre "GATR Tract," a part of the Mockhorn Island Wildlife Management Area (*see orange area on map at right*).

We, along with our Southern Tip partners (*see #3 below*), will be working this summer to identify the next parcel that could be purchased, in part, using a year or two of CZM funds (\$200-400k). These funds have to be matched with the same amount in non-federal dollars and the land must be held by a public entity.

## 2 CELCP Plan & Grants

The second way is through a relatively new (2002) land acquisition funding source called CELCP – the Coastal and Estuarine Land Conservation Program. It is modeled after the Forest Legacy Program and operates in a similar, but not identical way. (Go to: [http://coastalmanagement.](http://coastalmanagement.noaa.gov/land/welcome.html)

[noaa.gov/land/welcome.html](http://coastalmanagement.noaa.gov/land/welcome.html) for NOAA's description of the program.) CELCP funds flow from Congress to NOAA and generally on to state CZM programs. Recently, NOAA set up a process for states to compete for these funds and directed state CZM programs to prepare CELCP plans which lay out the state's coastal land acquisition priorities. CELCP proposals will be judged, in part, according to how well they fit the state's CELCP plan. We are currently drafting Virginia's CELCP plan and using our new Coastal GEMS internet mapping system (*see page 6*) to help us set our acquisition priorities. The draft plan will be available on our website for public comment in July.

Since 2002 Virginia has received about \$8 million in CELCP funds. These funds also require a 1:1 match with non-federal money and the land must be held by a public entity. Three million dollars of the \$8 million was earmarked for 50 acres in Jamestown. And another \$3 million was earmarked for the Potomac Gorge. Last December, \$200,000 of the Potomac Gorge earmark was used to purchase a conservation easement on the 5-acre Timblin tract.

Nearly \$1 million in CELCP funds was earmarked for acquisitions in the Dragon Run Watershed. Three sites that would use about half of the funds are currently being reviewed by NOAA for approval. More sites are being identified in collaboration with The Nature Conservancy and the Middle Peninsula Chesapeake Bay Public Access Authority.








Our most recent CELCP award was \$514,714 for the above mentioned Magothy Bay Natural Area Preserve. This brings the total contribution through the Virginia CZM Program for the Preserve to 35%.

CELCP is already having a noticeable impact in Virginia. It is imperative, during these tight federal budget times, that we let our Congressional representatives in Washington know how important this funding is to meeting Virginia's land conservation goals. It's also critical that we have state or local funds to match these federal funds.

After all, CELCP funding levels are almost on par with Land & Water Conservation Funds that Congress appropriates to states. The LWCF began in 1965 and although its authorization level is \$900 million per year (from offshore oil and gas lease sales), Congress generally appropriates only about \$90 million per year to states and another \$170 million to federal agencies. CELCP appropriations have been around \$35 million per year to the coastal states. FY 2008 marked the first year that President Bush included CELCP funding in his budget – a sign of the program's growing popularity.



### Lands Protected for Migratory Bird Conservation on the Southern Tip of Virginia's Eastern Shore

- |  |   |
|--|---|
|  Eastern Shore of Virginia National Wildlife Refuge (USFWS) |  Fisherman's Island National Wildlife Refuge (USFWS) |
|  Kiptopeke State Park (DCR)                                 |  Pickett's Harbor Preserve (TNC)                     |
|  Mockhorn Wildlife Management Area (DGIF)                   |  Magothy Bay Natural Area Preserve (DCR)             |
|  Smith's Island (TNC)                                       |  In transfer from TNC to USFWS                       |

### 3 Southern Tip MOU

It's important to remember that as we acquire lands for conservation in Virginia, our responsibility to manage those lands also grows. So a third way that the Virginia CZM Program is helping with land conservation is to be a signatory to partnerships such as the "Southern Tip" Memorandum of Understanding that protects migratory bird habitat on the Eastern Shore. The MOU was signed last December by the regional director of the US Fish & Wildlife Service; the Directors of the Department of Conservation & Recreation, the Department of Game & Inland Fisheries, and the Department of Environmental Quality (for the Virginia Coastal Zone Management Program); and The Nature Conservancy in Virginia.

In a nutshell, the MOU signatories agree to cooperate in the protection and management of conservation lands on the Southern Tip of the Eastern Shore in Northampton County for migratory bird habitat. Specifically, we will:

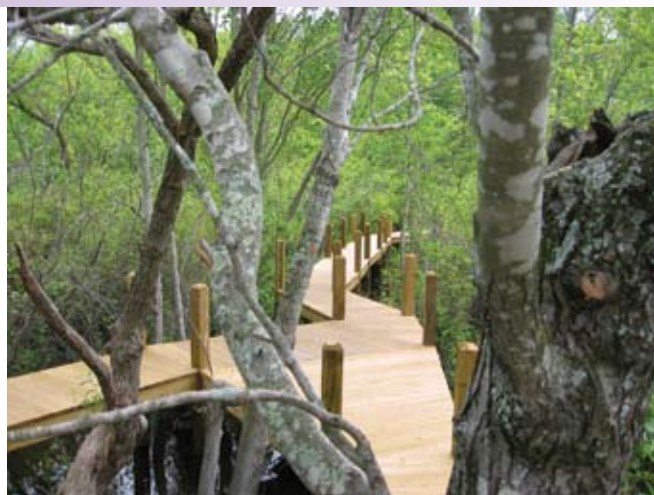
- Compile and annually update an inventory of conserved lands and their individual management plans.
- Determine the desired future condition of the lands for migratory bird habitat.
- Identify the tasks and resources needed to achieve the desired future condition.
- Determine how those resources can be obtained and shared.

Through the MOU we hope to achieve efficiencies in how resources such as staff expertise, restoration equipment and supplies are used and shared as well as create consistency and focus in the goals for which large tracts of land are managed.

### 4 Public Access Authorities

A fourth way Virginia CZM is helping with land conservation is by supporting the creation of "Public Access Authorities." Back in 2002, the Virginia General Assembly approved the first PAA – the Middle Peninsula Chesapeake Bay Public Access Authority. In 2003, Virginia CZM gave a \$10,000 grant to the Middle Peninsula Planning District Commission (PDC) to:

- Adopt By-Laws and an Operating Agreement for the MP CB PAA.
- List possible acquisition sites proposed by each of the member counties.
- Draft a summary of public access guides and maps produced in the Middle Peninsula.



Courtesy of MPPDC

*A new boardwalk, tucked carefully between the trees on the Dragon Run, provides a truly up-close experience to visitors. This public access site, on what is known as the Browne Tract, was purchased by the Middle Peninsula Public Access Authority with funds from the Virginia CZM Program. Photo by Lewie Lawrence, Middle Peninsula Public Access Authority.*

One of the most useful benefits of having a PAA is that it can acquire and hold land. Later in the same year it was formed, Virginia CZM awarded the PAA a \$392,000 grant to acquire the 274-acre Browne tract on the Dragon Run.

Having a local government authority that can buy land is a tremendous asset in trying to meet the Governor's 400,000 acre goal. Local authorities can often close on lands deals far more quickly than state and federal agencies. Plus, they create a meaningful avenue for local priorities to be addressed by local communities.

The Middle Peninsula PDC had such great success that it was soon copied by the Northern Neck PDC. So again, Virginia CZM gave a grant to the Northern Neck PDC to help create the Northern Neck Chesapeake Bay Public Access Authority. In 2005, the General Assembly approved this PAA and the four counties of the Northern Neck signed the PAA agreement in September 2006. The PDC has already completed an inventory of existing and potential public water access sites. They are well on their way toward acquiring lands that will serve both conservation and public access purposes.

In one more flash of good fortune, the 2007 General Assembly passed House Bill 2781 sponsored by Delegate Morgan which, "allows the Commonwealth Transportation Board (CTB), upon the request of a public access authority, to transfer to the authority any and all rights and interests of the Board in highways, highway rights-of-way, and landings without first abandoning or discontinuing them." This removed a huge obstacle to conserving road endings for purposes of public access to the water. With

funding from the Virginia CZM Program, the MPCBPAA has identified 300 roadways with public access capabilities running to or near waterways in the Middle Peninsula.

## 5 Mapping Important Areas

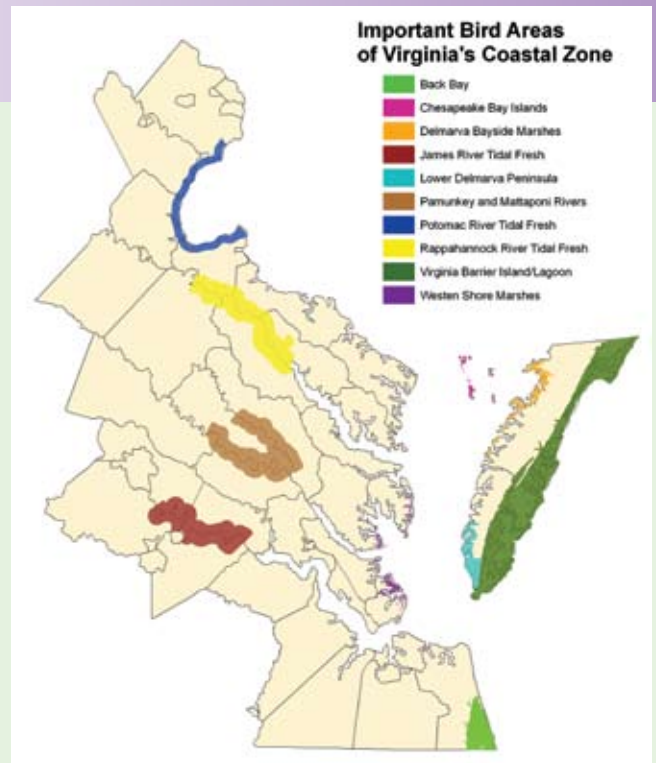
A fifth way Virginia CZM is helping with land conservation is in prioritizing which lands we deem “important” for maintaining the health of our coastal ecosystems. Another way to say it is “where is our critical blue and green infrastructure?” The article on page 6 describes our Coastal GEMS website and all the different map layers that are or will soon be on that site. Many of these layers can be used to help prioritize acquisition and restoration efforts. For example, if an agency is considering several different parcels to acquire, they could go to Coastal GEMS to see what important coastal resources are near any of those parcels. Some things to keep in mind would be the value of adding on to an existing protected area, or buying land upland of sensitive underwater features such as clam farms, oyster reefs or underwater grasses. You may also want to prioritize your acquisitions or restorations according to whether the parcels contain wetlands or sand dunes, or whether they fall within an “essential wildlife habitat” or an “important bird area” (see IBA sidebar at right).



Teta Kain, Friends of Dragon Run

*A Pickerel Weed in bloom on the Dragon Run.*

So there are at least five ways that the Virginia CZM Program can help with Governor Kaine's ambitious goal. You can help us conserve your favorite coastal lands. Encourage your local, state and federal legislators to support conservation of land in Virginia and don't forget to look at our draft CELCP Plan on our website. We want your input during the July 2007 public comment period. 🐾



## Mapping Important Bird Areas

VA CZM teamed with the National Audubon Society's Virginia chapter, William & Mary's Center for Conservation Biology (CCB) and the Department of Game & Inland Fisheries to identify the most important areas in Virginia's coastal zone for birds. Audubon's Important Bird Area Program sets standards for IBA status ([www.audubon.org/bird/iba/](http://www.audubon.org/bird/iba/) for more info). Dr. Bryan Watts at the CCB had piles of data dating back for years just waiting for such an opportunity to be synthesized. So we gave a CZM grant to Dr. Watts to put it all together. The results are shown in the map above and on our Coastal GEMS website. These areas help to prioritize acquisition and restoration efforts.



Courtesy NBA

*Aimee Weldon, with the National Audubon Society (center) presents Eastern Shore landowners Tim and Susie Brown (right) and B.A. and Bud (not shown) Flanagan (left) with Conservation Excellency Awards for improving habitat within Important Bird Areas. Photo courtesy of the National Audubon Society.*

# 400 YEARS OF CHANGE

By Shep Moon, Virginia CZM

The year 2007 is being celebrated across Virginia's coastal zone as the 400th anniversary of Jamestown, the first permanent English settlement in the New World. As part of this celebration, the voyages of John Smith and his crew of 14 men in a 30-foot shallop along the tidal waters of Virginia and Maryland have been recreated based on his account of what he saw on these voyages. Cruising along these same waters today, it's hard to comprehend exactly what Captain Smith must have seen, let alone the incredible changes that have occurred in the last four hundred years.

## Exploring the Bay by Boat in 1608

Smith's first voyage began at Jamestown on June 2, 1608. Over the next three months and 1,700 miles he explored the bayside of the Eastern Shore, the Rappahannock and Potomac Rivers, and the entire length of the Chesapeake Bay. Although his goal was to find a shortcut to the Far East or to find precious metals to send back to England, what John Smith achieved on these early voyages on what he called his "discovery barge" ultimately proved to be much more important.

John Smith returned to England in 1609 and in 1612 he published an account of his exploration as well as a surprisingly accurate map of Virginia which guided further exploration and settlement for the remainder of the 17th century. Smith's accounts of the abundance of fish and wildlife, along with his description of the coastal landscape, led him to proclaim that "Heaven and earth never agreed better to frame a place for man's habitation." His glowing description of Virginia, along with his map, undoubtedly influenced others to make the journey to the New World and began a flood of European immigration that would not only lay the foundation for our maritime heritage, but radically affect our coastal resources.

## "Re-Settling" a Settled Land

English colonists were not, of course, the first people to recognize the benefits of coastal living in Virginia. When John Smith made his voyages of discovery, he encountered a well developed culture of about 13,000 Algonquian-speaking people who had settled along coastal waters thousands of years ago. They called the Bay "Chesepioc," which means "great shellfish bay" because for them it provided not only a means of transportation, but a key source of food. The Algonquians had

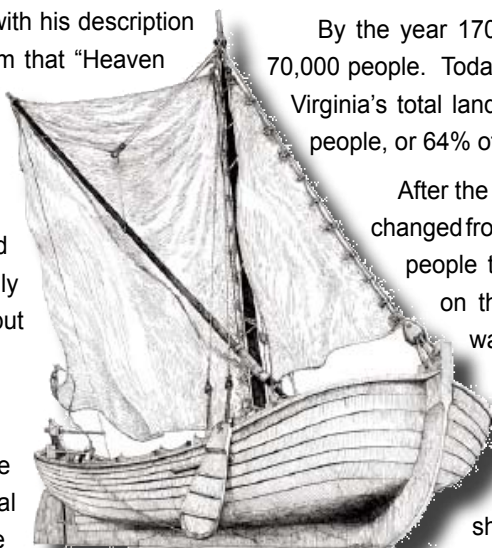
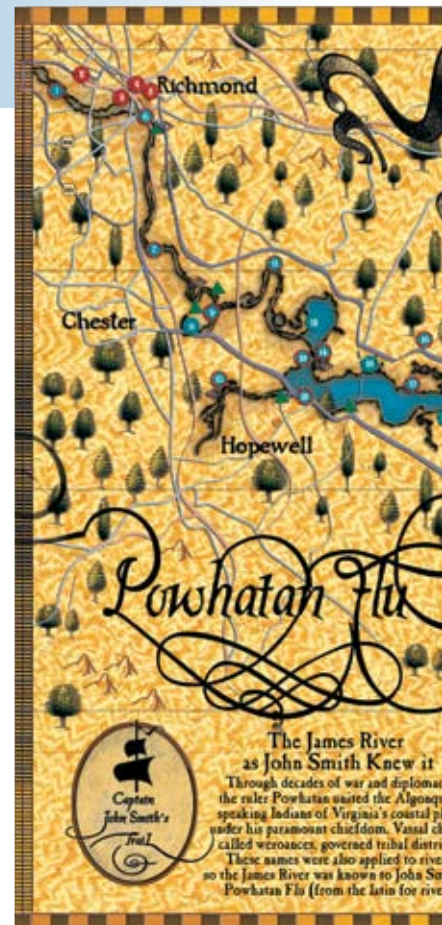
already encountered Spanish, French, English and Portuguese explorers throughout the 16th century. Spanish Jesuits had attempted to settle near the York River in 1570, but the settlement was wiped out by Algonquians in 1572. England's initial attempt at colonization also failed when they tried to start a colony on Roanoke Island, North Carolina with the intention of eventually relocating to the Chesapeake Bay.

The Jamestown settlement also had a very difficult beginning and came very close to total failure several times. By 1625, only 1,100 of the 7,500 colonist that had settled in Virginia had survived. The rest perished due to famine, disease and battles with the Algonquians. But by the slimmest of margins, the colony eventually succeeded and was the primary English settlement in North America for many years.

By the year 1700, the Virginia colony had grown to about 70,000 people. Today, Virginia's coastal zone, just about 22% of Virginia's total land area, is home to an estimated 4.9 million people, or 64% of the Commonwealth's population.

After the arrival of the colonists, the coastal economy changed from the subsistence practices of the Algonquian people to a trade-based economy relying primarily on the cash crop of tobacco. Tobacco farming was a very lucrative but labor intensive form of agriculture. Early planters soon found that immigration from Europe and natural population increases couldn't supply an adequate labor force and in 1619 a Dutch ship brought the first Africans to Virginia. By 1700, large numbers of African slaves were arriving to support the expanding plantation economy.

The economy slowly diversified, however, and by 1860 Virginia was the leading manufacturing state in the South. Shipbuilding and repair became economic mainstays and the age of steamships brought increased opportunities for trade throughout coastal



Sultana Project



## A Catalyst for Change...



Courtesy APVA

Captain John Smith (above) traveled 1,700 miles throughout the Chesapeake Bay. His narratives and maps of the region served as a catalyst for an influx of settlers and change to Virginia. The Captain John Smith Water Trail was recognized by Congress in December 2006 ([www.virginia.org/johnsmithtrail](http://www.virginia.org/johnsmithtrail)). The James River portion of trail is shown in the map at left.

Virginia and the growth of numerous small steamship ports. The presence of numerous military installations has also had a strong influence on the coastal economy, with Norfolk now hosting the world's largest naval base and Portsmouth the world's largest ship-repair yard.

Harvesting coastal resources such as fish, oysters and crabs is, of course, the economic activity most associated with coastal Virginia. Whether from large trawlers from the Reedville fishing fleet or by independent watermen in traditional Deadrise workboats, fishing has been, and remains, an important part of the coastal economy. As leisure time and disposable income have gradually increased, coastal waters have also increasingly lured tourists and people looking for recreation on the water.

In the late 19th and early 20th century, resort areas such as Virginia Beach, Buckroe Beach, Ocean View and Colonial Beach became popular destinations. After World War II, weekend cottages and summer homes became more common along coastal waters. In many coastal areas today, waterfront development for retirement and leisure, along with the support services for these new residences, is the principle source of economic growth.

## A Change from Work to Pleasure...



Larry Chewning

Working waterfronts once dominated the coastline. However as coastal population and disposable income have increased, recreation has become a primary coastal activity, as the pleasure craft moored next to the workboats in this photo illustrate. Demand for waterfront access has resulted in competition for the once seemingly endless waterfront, resulting in conflicts in a growing number of coastal communities. (See page 23 for a summary of one such area under study with Virginia CZM funding.)

## Changes for Our Native Species...

*Today, it's hard to imagine that Captain John Smith found oysters so plentiful that during one of his journies around the Bay he and his men lived on them for ten weeks, and that birds were so plentiful that they flew above in the thousands.*



Piles of oyster shell accumulated during peak oyster harvesting in the early 1900s.

Courtesy of CCB



*A pair of eaglets, representing a fraction of 17th Century populations, wait for a meal on a nest along the Rappahannock River. Although Bald eagles have made a resurgence in the United States because of a ban on DDT and protection provided by the Endangered Species Act, biologists are concerned that prime eagle habitat is rapidly being taken over by development.*

## Change is the Constant

Changes in the coastal population, economy and land use patterns over 400 years have also meant significant changes for our coastal resources. Conversion of riparian forests and wetlands to farm fields, homes and businesses has affected water quality and coastal habitats. Shoreline hardening for erosion control has destroyed miles of important fringe wetlands and beaches, and has created barriers between riparian and nearshore environments.

Some once common species, such as the Passenger Pigeon, Carolina Parakeet, Eastern Cougar, Eastern Elk and Timber Wolf have become extinct or are no longer found in Virginia. Other key species can still be found, but in significantly reduced numbers. Underwater grasses, for example, which provide important habitat, oxygenate the water, and help prevent erosion, have decreased from an estimated 200,000 acres in the Chesapeake Bay to only 59,090 in 2006 because of poor water quality. Oyster reefs, which once were so common that they posed navigation hazards and could filter the entire volume of the Chesapeake Bay in only a few days, have been severely depleted due to over-harvesting, disease, and stress from poor water quality. Still other species, not native to the area, have flourished and caused problems for natives. Invasive species are the number two threat to biological diversity, second only to loss of habitat (and species) from development and urban sprawl. Exotics such as mute swans, *Phragmites* (common reed) and the rapa whelk have thrown coastal ecosystems out of balance.

Coastal resources are also being affected by changes beyond our borders such as global warming and land subsidence.

These factors have the combined effect of accelerating the loss of thousands of acres of waterfront land. Jamestown Island for example, where the first colonists settled, has been reduced from 1,513 acres in 1910 to 978 acres – an average of almost six acres annually. In some cases entire islands, and the communities that they once supported, have vanished. Before 1900, coastal waters rose at a slow but steady rate of around three feet every 1000 years. In the 20th Century alone, however, water levels rose one foot, and the rate of increase appears to be accelerating.

## How Will We Manage the Changes to Come?

Each of these changes demonstrates the need for coastal resource management. In several cases, improved management practices have already helped restore important resources. Although once severely depleted, species such as ospreys, eagles, beaver and rockfish have made remarkable comebacks. But many challenges remain. The Virginia Coastal Zone Management Program, through its network of agencies and various initiatives, is designed to help meet these challenges.



*Phragmites australis (photo left) is one of the most serious and problematic invasive plant species in Virginia and other coastal states. This fast-spreading plant, which grows in disturbed areas, crowds out native marsh plants. (See [www.deq.virginia.gov/coastal/vshp/goals.html](http://www.deq.virginia.gov/coastal/vshp/goals.html) for Virginia CZM projects to map and control Phragmites, and provide information to private landowners, on the seaside of the Eastern Shore.)*

Initiatives focus on correcting existing coastal resource problems as well as avoiding future problems by planning for and managing change. The challenge for the Virginia CZM Program lies in finding ways to accommodate growth and economic development while protecting the natural and cultural resources that fuel this growth and ultimately help determine our overall quality of life.

To better appreciate Virginia's tremendous coastal resources and the resource management challenges we face, travelers today can revisit many of the areas first viewed by John Smith and his band of explorers 400 years ago. On December 19, 2006 the Captain John Smith Chesapeake National Historic Water Trail was

created. It is the nation's first all-water National Historic Trail. As we reflect on what Captain Smith saw and the massive changes that have occurred in Virginia's costal zone, it's important to remember that change is still occurring, probably at a faster rate than ever before, and that we need, more than ever, to take steps to plan for and manage that change. 🦋

### Recommended Reading:

*Landfall Along the Chesapeake* by Susan Schmidt

"Beyond Jamestown", *Smithsonian Magazine*, May 2007  
([www.smithsonianmagazine.com/issues/2007/may/destamer\\_chesapeake.php](http://www.smithsonianmagazine.com/issues/2007/may/destamer_chesapeake.php))

"Legacy of Jamestown", *National Geographic*, May 2007.

## Changes to Our Shorelines...



A NOAA chart from 1868 and air photos from 1937 and 2002 (courtesy of VIMS) illustrate shoreline changes in the Travis Point / Hog Island area of Northumberland County. As a result of rising sea level and related shoreline erosion, Hog Island is greatly diminished between 1868 and 1937, and completely submerged by 2002. With the exception of the small village and steamboat landing of Lewisetta, the vast majority of the shoreline in the 1937 photo is undeveloped. By 2002, however, much of this same shoreline is built out with retirement or vacation homes. The Virginia CZM Coastal Partners Workshop (details on the back page) will focus on the issues of climate change and population growth.



# A SITE 400 YEARS IN THE MAKING

By Virginia Witmer, Virginia CZM

*"The six and twentieth day of April, about four o'clock in the morning, we descried the land of Virginia; the same day we entered into the Bay of Chesupioc we could find nothing worth the speaking of but fair meadows and goodly tall trees, with such fresh waters running through the woods as I was almost ravished at the first sight thereof." – George Percy, member of the Virginia Company*

Following that "first landing" (now site of First Landing State Park in Virginia Beach), the explorers pressed on, looking for a secure place to settle, away from the channel and safe from Spanish ships. The English, like the Spanish before them, were looking for ways to benefit from North America.

## Jamestown's Birth

On May 14, 1607, the Virginia Company ships landed on Jamestown Island, a peninsula on the banks of the James River, 60 miles from the mouth of the Chesapeake Bay.

The inhabitants of Jamestown then began a struggle to survive that lasted well over a decade and was punctuated by conflict - within their group and with their Native American neighbors - and by starvation and disease - Jamestown was not a healthy place to live (mosquitoes carried diseases, the weather was hot, water was not always potable from the river and food was scarce). The settlers could not know that they also arrived in the middle of a multi-year drought. Over half of the settlers died within that first year of arrival, many from disease, and more deaths followed during the "starving time" in 1609.

But the settlement survived. And it grew and expanded into the late 17th century, leaving legacies quintessential to the American spirit - among them, private enterprise and representative government. This venture by the Virginia Company was a money-making one, and although many attempts at starting industries failed, tobacco became the settlement's key export crop. The first representative assembly in the New World convened in the Jamestown church on July 30, 1619. It became the model for assemblies in other colonies.

## Jamestown's Changing Role in History

Jamestown remained the capital of Virginia until its major statehouse, was burned in 1698. The capital was moved to Williamsburg that year and Jamestown began to slowly disappear. By the 1750s the land was primarily owned and heavily cultivated by two families. A military post was located on the island during the American Revolution, and American and British prisoners



Courtesy APVA

*When they say "we've only scratched the surface", they mean it literally at the site of the Jamestown Rediscovery archaeological dig. Year by year, Historic Jamestowne is revealing itself as archaeologists continue to uncover an extraordinary trove of artifacts, providing a growing understanding of what life was like 400 years ago.*

were exchanged there. In 1861, the island was occupied by Confederate soldiers who built an earth fort near the church as part of the defense system to block the Union advance up the James River. Little further attention was paid to Jamestown until preservation was undertaken in the twentieth century.

## Jamestown's Rebirth

In 1893, Mr. And Mrs. Edward Barney, owners of the 1500-acre site of Jamestown, gifted 22 ½ acres to the Association for the Preservation of Virginia Antiquities (APVA). This area, now known as "Old Towne," includes the 1639 church tower and is also the location of the James Fort. By 1893, erosion had eaten away the island's western shore and James Fort was presumed to lay completely underwater. With federal assistance, a sea wall was constructed in 1900 to protect the area from further



Courtesy APVA

*A sample of James Fort-Period artifacts, including delftware apothecary jar, Martincamp neck fragment, crucible, Border ware candle stick, Bartmann jug fragment, copper scrap, cloth seal, lead shot, copper-alloy jetton (a metal counter used in playing cards), and fishhook.*

erosion. The remaining acreage on the island, the area into which settlement expanded during the 17th century, and now known as "New Towne", was acquired by the National Park Service (NPS) in 1934 as part of the Colonial National Historical Park. In 1994, archaeologist William Kelso discovered the footprint of James Fort. Today, Historic Jamestowne is jointly operated by the APVA and NPS.

The archaeologists and additional interpretive staff at Historic Jamestowne help visitors understand the significance of the finds and of the information to be derived from subtle signs in the dirt. An "archaearium," a state-of-the-art interpretive and exhibit space, opened in May 2006. A new National Park Service visitors center opened late in 2006 to tell the history of Jamestown before and after the arrival of the English.

As we celebrate the 400th anniversary of the founding of Jamestown, plan to spend at least a day at Historic Jamestowne and Jamestown Settlement. There is a lot to see and much more to ponder. Jamestown Settlement, operated by the Jamestown-Yorktown Foundation (Commonwealth of Virginia), is located adjacent to the entrance of Historic Jamestowne.

Jamestown Settlement is a living-history and educational center that includes an opportunity to board replicas of the ships - the *Susan Constant*, *Godspeed* and *Discovery*. When you disembark, there are galleries to explore, a film to catch which details the cultures that came together at Jamestown (Indian, British and African), and a re-created Powhatan Village and James Fort, where you can engage in period activities, such as grinding corn or playing quoits. Interpretive staff help you step back into the daily life of a 17th-century colonist. 🐘

-- Thanks go to the informative websites below for information contained in this article.

### Learn More From These Websites

<http://historicjamestowne.org/index.php> - Association for the Preservation of Virginia Antiquities' **Historic Jamestowne website**, including updates on the **Jamestown Rediscovery dig**.

[www.apva.org/jr.html](http://www.apva.org/jr.html) - APVA's Jamestown Rediscovery archaeological project website.

[www.nps.gov/jame](http://www.nps.gov/jame) - National Park Service's Historic Jamestowne website.

[www.jamestown2007.org/](http://www.jamestown2007.org/) - Official Jamestown 2007 event website, from the Jamestown-Yorktown Foundation.

[www.mariner.org/chesapeakebay/colonial/col009.html](http://www.mariner.org/chesapeakebay/colonial/col009.html) - The Mariners Museum Interactive John Smith 1612 Map of Virginia.

[www.virtualjamestown.org/](http://www.virtualjamestown.org/) - Virtual Jamestown Archive - featuring texts of original documents from Jamestown settlement. A project of the Virginia Center for Digital History.

[www.historyisfun.org/](http://www.historyisfun.org/) - Jamestown Settlement, administered by the Jamestown-Yorktown Foundation, a Virginia agency.



## Omar Visits Japan!



Courtesy of JZS

Omar of the Reef, official mascot of the Virginia CZM Program's oyster restoration and gardening efforts, was formally invited to assist with public relations at the April U.S.-Japan Oyster Reef Symposium in Chiba Prefecture, Japan.

The collaborative Symposium focused on the ecological value of natural oyster reef habitat. Dr. Mark Luckenbach, VIMS, presented at the Symposium on Virginia's natural reef systems. Research on oysters in Japan has historically focused on commercial oyster

aquaculture. But the discovery of an oyster reef in Tokyo Bay has sparked the interest of the Japanese public and scientists in the value of wild oysters.

Japanese researcher Urara Takashima (above), who organized the Symposium, visited Virginia in the spring of 2006 after learning more about Virginia CZM's oyster restoration efforts. Ms. Takashima returned with educational materials, including tattoos of Omar. At the behest of school children, who thought Omar needed a Japanese friend, she created "Kaki-hime", or "princess oyster" (at right).



Urara Takashima

The story does not end there! After Ms. Takashima returned to Japan, she shared a copy of our Virginia Oyster Gardening Guide with Katsunori Tanaka, member of a Japanese environmental non-profit, who then translated the guide into Japanese. His organization is conducting environmental programs to improve Tokyo Bay, including growing oysters, clams, and seaweed.

— Virginia Witmer, Virginia CZM

# NEWS AROUND THE ZONE

## Beyond Brochures: Using the Media to Prevent Pollution

While working in the yard this spring, more and more Northern Virginia residents may think they are hearing strange voices emanating from a nearby storm drain!

Convincing Northern Virginia residents that what goes into a storm drain can pollute a local stream is not an easy task. Dog waste, excess fertilizer, and used motor oil are just a few of the pollutants that flow from neighborhood lawns, sidewalks and streets to the Potomac River and into the Chesapeake Bay. While educational brochures are a handy tool and represent the typical vehicle for environmental outreach programs, Northern Virginia governments have begun using more horsepower - the media - to inform residents about pollution and to meet regional goals for cleaning up local waterways.



For the third consecutive year, Northern Virginia local governments and water utility companies, in conjunction with the Northern Virginia Regional Commission, are using a 60-second radio spot featuring a tough-talking storm drain to get their pollution prevention message out. This year's campaign uses print materials, in addition to radio spots, with the theme: "Only Rain Down the Storm Drain."

The consortium of local governments and water utility companies has also decided to brand their initiative by calling themselves the Northern Virginia Clean Water Partners. The "Partners" currently include the Counties of Arlington, Fairfax, Loudoun, Prince William, the cities of Alexandria, Fairfax, Falls Church, the towns of Herndon, Vienna, and Fairfax Water and the Loudoun County Sanitation Authority. For the first time, the radio campaign will attempt to "drive" listeners to action by directing them to a new website ([www.onlyrain.org](http://www.onlyrain.org)) that has more in-depth information on the issues, good practices, how to get involved in volunteer cleanup efforts, and links to other pollution prevention websites.

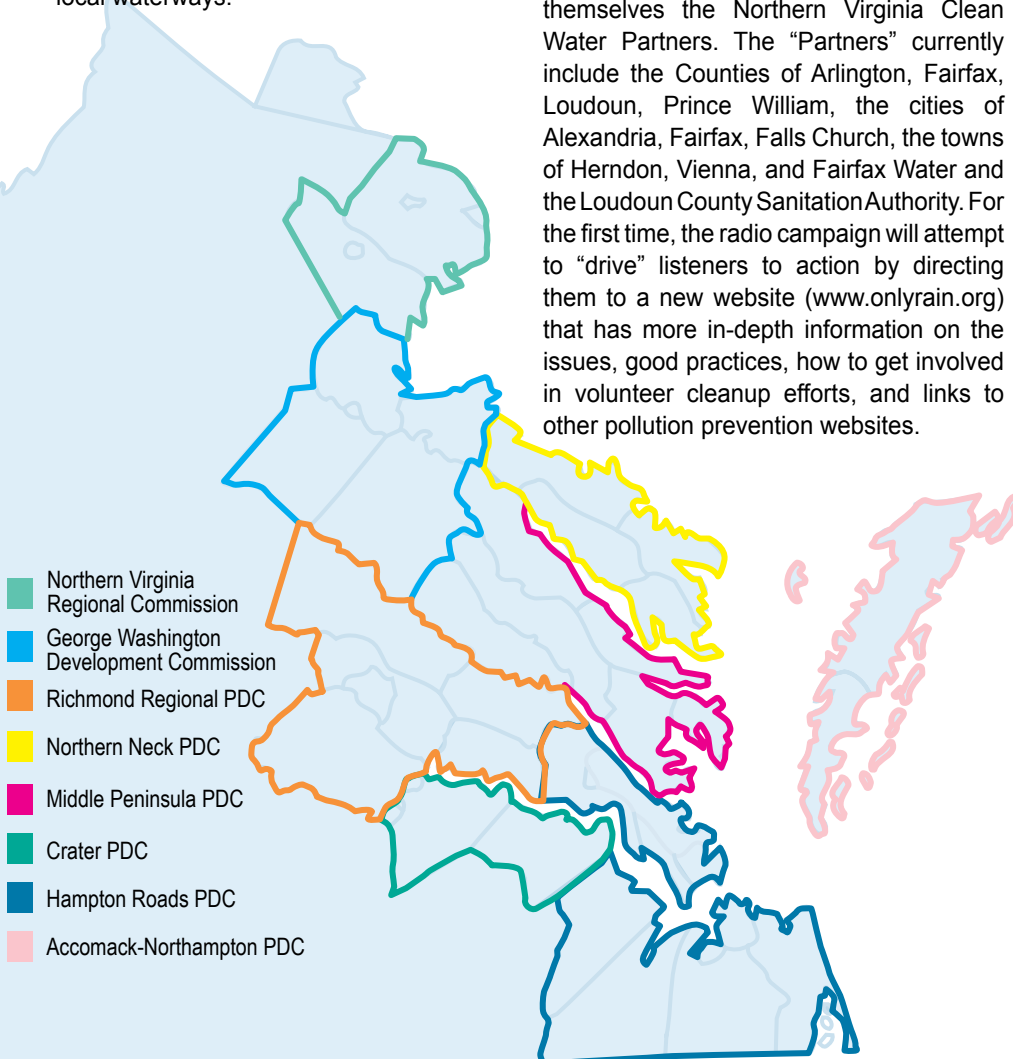
The Northern Virginia Clean Water Partners also intend to conduct another pre- and post-campaign survey to help quantify the effectiveness of the program. Last year's survey found that half the residents who heard the advertisement would "think differently about disposing of motor oil, fertilizing their lawn and picking up their pet's waste." Three out of four residents indicated a "high" degree of concern after listening to the advertisement. And almost 9 out of 10 residents surveyed approved using tax dollars on this type of outreach campaign. For more information on the campaign see [www.onlyrain.org](http://www.onlyrain.org) or contact Laura Grape, Northern Virginia Regional Commission, (703) 642-0700 or [lgape@novaregion.org](mailto:lgape@novaregion.org).

—Doug Pickford, NVRC

## MPPDC Addresses Waterfront Use Conflicts

Many waterfront communities on Virginia's Middle Peninsula are experiencing a shift in character. Once rural, these areas are now part of a growing suburbia. Also growing are conflicts among the multiple interests who rely on these areas for their livelihood or for their recreation. Gloucester County is home to many such waterfront communities. Not only does the county support a commercial fishing industry and other water-dependent enterprises as part of its working waterfront, it is home to new businesses and new residential development. Waterfront property values in the county have been increasing dramatically as has the competition for space. As the infrastructure supporting working waterfronts disappears, public policies that once served as management tools for both nearshore land and for water access, uses and privileges are becoming inadequate.

Gloucester is the focus of a study being conducted by the Middle Peninsula Planning District Commission, and funded by Virginia Sea Grant's Coastal Community Development Program, to better understand existing uses and constraints of the Peninsula's nearshore areas and waterfront communities.



GIS data and aerial maps were presented at a January 2007 forum to give the public an opportunity to share and discuss the location and nature of current and possible use conflicts. Approximately 50 individuals, representing Middle Peninsula residential property owners, waterfront business owners, the aquaculture industry, state officials, and private citizen groups, attended the forum. Many not only voiced their concerns and potential solutions to the landside-waterside use controversy, but also pinpointed specific areas of use conflict on aerial maps.

After this forum, the MPPDC performed a geospatial (GIS) analysis of one area of conflict in Gloucester County - the north shore of the York River, from the George P. Coleman Bridge to the Guinea Marshes. Data was collected related to water-dependent uses; regulations regarding use standards and zoning of waterways; existing infrastructure and proposed public improvements adjacent to and within conflict zones; and sensitive and significant habitats, such as wetlands and shellfish areas, that could be adversely impacted by transitioning uses. This synthesis also included identifying the management stakeholders to be involved in any use-conflict resolution measures that may be undertaken.

Information collected at the public forum will support a series of facilitated, public stakeholder meetings conducted in the spring of 2007 and funded by the Virginia CZM Program. A Use Conflict Recommendation Committee will be appointed and charged with synthesizing the work of the stakeholders into a final report, which will be presented to the Gloucester Board of Supervisors.

—Jacqueline Shapo, NOAA/CSC Coastal Management Fellow

## Conservation Subdivision Design on the Northern Neck

The Virginia CZM Program has been providing assistance to localities on the Northern Neck to encourage “conservation subdivision design”, a development technique that concentrates development



A conservation subdivision plan drawn by Randall Arendt, which incorporates and conserves environmentally significant areas.

on the most suitable portions of a property while protecting the most environmentally significant areas.

Last summer, the Northern Neck Planning District Commission (NNPDC) hosted a workshop in Warsaw featuring well known conservation planning speaker Randall Arendt. Over 70 people attended the event including planning commissioners, members of local boards or supervisors, local land use administrators, developers, realtors, local conservation organizations and other interested citizens.

*“...what an accomplishment... developers, local officials and conservation organizations all agreeing on a single way to meet their diverse, and often conflicting, objectives.”*

— workshop attendee

Mr. Arendt discussed the principles of conservation subdivision design, which he refers to as “golf course communities without the golf course”. He provided a number of examples of how localities have amended their land use ordinances to encourage development designs that protect important natural resources and rural character while maintaining economic viability. He then conducted a hands-on design exercise where participants were asked to create a residential subdivision that conserved as much of the natural resources and open

space on the site as possible. Participants in the workshop were very supportive of Mr. Arendt’s design principles. One attendee remarked on what an accomplishment it was to have developers, local officials and conservation organizations all agreeing on a single way to meet their diverse, and often conflicting, objectives. According to Stuart McKenzie of the NNPDC, this enthusiasm has generated interest among localities, influenced project designs and generally raised awareness of the potential of conservation design on the Northern Neck.

Richmond County officials were particularly interested in promoting conservation design principles and wanted to have Mr. Arendt evaluate their land use ordinances for consistency with these principles. With assistance from the Virginia CZM program, the County contracted with Mr. Arendt to review and critique their comprehensive plan, subdivision ordinance, and zoning ordinance. After conveying his comments to the County through several memos about their plans and ordinances, Mr. Arendt then held a three hour work session last October with County officials and the public to review his suggestions and field questions.

According to Chris Jett, Richmond County Director of Planning and Information, Mr. Arendt’s work was well received and the Planning Commission is interested in holding additional work sessions to discuss his recommendations further. He said the County is particularly interested in creating a “County-wide Map of Potential Conservation Lands” as part of the County’s Comprehensive Plan and the idea of a multi-step procedure for reviewing development proposals, including requirements for a site analysis map and a site visit at the beginning of a development proposal to identify significant resources.

—Shep Moon, Virginia CZM



# VISIT YOUR COASTAL PUBLIC ACCESS SITES

## If Captain John Smith Could See It Now

On April 26, 1607 when John Smith and the Virginia Company arrived at what is now called First Landing State Park in Virginia Beach, there was no boardwalk, no cabins, no amphitheater, and no gift shop. But today, for you, all those things are available at Virginia's most visited state park ...and the boardwalk just got a very upscale makeover!

The Virginia Department of Conservation and Recreation overhauled the park's 20 year old elevated boardwalk with funding from state sources, the Virginia CZM Program and the Virginia Recreational Trails Fund Program (using Federal Highway Administration funds).

In addition to the park's historic significance, its 2,888 acres have tremendous natural significance. First Landing, originally called Seashore State Park when bought by the state back in 1933, was added to the National Register of Natural Landmarks in 1965 "because of its distinction as the northernmost location on the East Coast where subtropical and temperate plants grow and thrive together," according to DCR's website: [www.dcr.virginia.gov/state\\_parks/fir.shtml](http://www.dcr.virginia.gov/state_parks/fir.shtml).

— Laura McKay, Virginia CZM



Patsy Arnett, [www.arnettandassociates.com](http://www.arnettandassociates.com)

*The new 450-foot long, 10-foot wide boardwalk at First Landing State Park, where a reenactment was held on April 27, would have provided easy access for Captain John Smith and members of the Virginia Company. Up to 20 people can gather round to listen to interpreters on one of three platforms.*



Laura McKay

*View of Town of Cape Charles from it's bayside beach.*

## Birding Festival Moves to Cape Charles

Since 1993 the Eastern Shore Birding & Wildlife Festival has been held on the grounds of the Sunset Beach Resort. This year the October 5-7 festival will be held in the charming Bayside Town of Cape Charles. The Friday evening reception will be held in the Palace Theater on Mason Avenue overlooking the harbor. Registration and exhibits will be held in the town's fire house on

Mason Avenue and workshops will be held at various locations throughout the town. The Town will host a "Lure of the Shore" event on Saturday night with local food and music. Festival goers will be able to walk to Cape Charles' shops and restaurants and also enjoy the town's extensive jetty pier built with Saltwater Recreational Fishing License and CZM funds. To find out more and register for the festival go to [www.esvachamber.org/festivals/birding/](http://www.esvachamber.org/festivals/birding/).

— Laura McKay, Virginia CZM

## 2007 Back Bay Forum

The Back Bay Restoration Foundation, in conjunction with the Virginia Coastal Zone Management Program, hosted the Back Bay Forum on March 17, 2007. The Forum was held in Virginia Beach and attracted 140 participants. Some of the topics included histories and current status of resources such as waterfowl, fish and submerged aquatic vegetation in Back Bay. The Forum also covered *Phragmites* control, phytoremediation, living shorelines, riparian buffers, green roofs and green infrastructure. There was also a panel discussion of water quality issues on Nawney Creek, a tributary of Back Bay that is currently on the impaired waters list because of high levels of bacteria. In addition to sponsoring the Forum, Virginia CZM has provided funds for a project to use water quality models to evaluate the effectiveness of a range of potential best management practices that could be used to address the Nawney Creek impairment. For more information on the Foundation or the Forum, including summaries of presentations, visit the Foundation's website at [www.bbrf.org](http://www.bbrf.org) or contact Susan Admire, the Foundation's Executive Director, at [bbrf@verizon.net](mailto:bbrf@verizon.net).

– Shep Moon, Virginia CZM

## New Northern Virginia Stormwater Guidebook

Snow melt and rainwater keep gardens green, streams and rivers full, and wells from running dry. However, serious erosion and water quality problems can occur when there are excess amounts of stormwater and there is a lapse in the maintenance of the facilities that help clean the water and moderate its flow.

The Northern Virginia Regional Commission recently published **A Guidebook for Private Owners and Operators**, a resource on the topics of managing stormwater runoff and the maintenance of stormwater management facilities. It introduces readers to the maintenance needs for 11 of the most common traditional and innovative best stormwater management practices (BMPs) found in Northern Virginia. The guidebook also provides guidance for



Kelly Price

*Dan Kavanaugh, Director of the Middle Peninsula Planning District Commission is interviewed about the tremendous value of the Dragon Run.*

## Dragon Run DVD

The recently released DVD, **The Dragon Run: A Step into the Past, A Strategy for the Future**, tells the story of efforts to protect the Dragon Run Watershed and the way of life it supports. The DVD, funded by Virginia CZM, includes interviews with individuals who have been at the forefront of these efforts and who represent varying perspectives on how this protection is being achieved. The DVD provides insight into the many ways in which the

Dragon Run is valued. A desire to preserve the Dragon's ecological value coexists with a desire to protect private landowner rights. How these goals work hand in hand has shaped the planning efforts that have taken place in the Watershed.

By taking this holistic approach to watershed planning, one that is grounded in diverse stakeholder involvement, the Dragon Run Steering Committee and other partners in the Special Area Management Plan have achieved significant results. Their multi-faceted approach, which includes education, land-use planning, sustainable natural resource-based economic development, and estate planning, has established a foundation upon which the mission of the Dragon Run Watershed Management Plan can ultimately be achieved. The mission: support and promote community-based efforts to preserve the cultural, historic, and natural character of the Dragon Run, while preserving property rights and the traditional uses within the watershed.

The DVD is a tremendous outreach tool. Over 500 copies have already been distributed to citizens across the watershed and throughout the Middle Peninsula region. The DVD will be provided to schools and libraries in the watershed in the near future.

– Sara Stamp, MPPDC

planning maintenance costs, contains a troubleshooting guide, and lists local government contacts and additional resources.

The guidebook will be distributed to homeowner associations and other private owners and operators, such as businesses and residents, by local government staff. NVRC will retain a limited number of hardcopies for distribution to other interested parties, upon request. The guidebook is also accessible in Adobe PDF format on the web at [www.novaregion.org/bmp.htm](http://www.novaregion.org/bmp.htm) and high-resolution copies are available on CD-ROM. For copies, contact Laura Grape, Northern Virginia Regional Commission, at 703.642.0700 or [lgrape@novaregion.org](mailto:lgrape@novaregion.org).

– Doug Pickford, NVRC



# Virginia Coastal Zone

## MANAGEMENT PROGRAM



Courtesy of Portsmouth Chamber of Commerce

## Virginia CZM Partners Workshop Portsmouth December 6 & 7, 2007!

### Theme:

Impacts of climate change and population growth on our coast.

### Location:

Renaissance Portsmouth Hotel and Conference Center. Rooms have been blocked at the government rate of \$77.

### Cost:

\$100 for both days includes breakfasts, lunches and breaks. A one day registration rate will be available on December 6 for \$75 and December 7 for \$50.

**Go to [www.deq.virginia.gov/coastal](http://www.deq.virginia.gov/coastal) for updates!**

*Portsmouth is dedicated to preserving its coastal heritage. The Olde Towne Historic District is one of five districts in the city listed on the Virginia Landmarks Register and the National Register of Historic Places.*

Virginia Coastal Zone Management Program  
Virginia Department of Environmental Quality  
P.O. Box 1105  
Richmond, Virginia 23218

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